in a power system, wherein the relay output bits are the result of a fault determination calculation process in the one relay which would conventionally be used to set output contacts of said one relay, comprising:

means at the one relay for formatting said output bits into a data packet;

means for directly transmitting said data packet over a communications link to said second relay, bypassing said output contacts of said one relay and any associated communications means; and

means at the second relay for receiving said data packet, verifying the validity of said data packet, obtaining the transmitted output bits from said data packet and then utilizing said obtained output bits as input bits in its own fault determination calculation process.

Claim 5 (amended). An apparatus of claim 4, wherein the validity of the data is expressed in the form of [an internal bit,] additional bits in the data packet [which can be used in logic equations performed by the relays].

Claim 7 (amended). An apparatus of claim 1, including means for programming [the individual output and input bits relative to specific relay functions] the protective relays to accomplish selected monitoring functions, wherein the output bits are representative of the results of said monitoring functions.

REMARKS

Reconsideration of the application as amended is respectfully requested.

In the action of September 12, 1996, the examiner rejected claims 1-7 on the basis of double patenting over co-pending application Serial No. 546,477; objected to Figure 1 of the drawings; rejected claims 1-7 under 35 U.S.C. 112, second paragraph, as being indefinite; rejected claims 1-4 and 6 under 35 U.S.C. 103 as unpatentable over Cookson et al in view of Miyagi et al; rejected claim 5 under 35 U.S.C. 103 as unpatentable over Cookson in view of Miyagi and further in view of Gambale et al; and rejected claim 7 under 35 U.S.C. 103 as unpatentable over Cookson in view of Lebby et al.

U.S. patent application Serial No. 08/546,477 has been abandoned. Hence, the provisional rejection under 35 U.S.C. 101 is

moot and should be withdrawn. The objection to Figure 1 of the drawings is noted. This correction will be made when formal drawings are filed in the Patent and Trademark Office following allowance of the application.

With respect to the examiner's rejection of claims 1, 5 and 7 under 35 U.S.C. 112, those claims have been amended to satisfy the examiner's objections. With respect to claim 1, note that the transmitted data packet contains "output" bits from the one relay which are used as "input" bits for the receiving relay. This is quite clear in the specification. Claim 5 has been amended to clarify the validity bits, while claim 7 has been amended to clarify the monitoring of specific relay functions. Claim 6 of the specification has also been amended to clarify Figure 2. The amended description is now consistent with Figure 2 and other portions of the specification.

With respect to the prior art, the novelty of applicants' invention lies in the grouping of the output function bits produced by one relay into data packets and then transmitting those data packets directly between two relays, to accomplish the communication of the status of the output function determinations of the two relays.

As stated in the specification, previous systems use the output function bits generated by one relay as a result of the relay's fault determination to first set output contacts within that relay. The status of the output contacts is monitored by communications equipment associated therewith in the one relay. When a change in output contact status is noted, that information is transmitted over a data link to the other relay.

The present apparatus eliminates the monitoring of the relay output contacts for this function and the communications equipment, including input/output devices, at each relay. Communication of the status of the output function bits of the one relay is thus faster, more reliable and less expensive with the present invention.

Claim 1 now clearly specifies this key feature of direct transmittal of output function bits. Claim 1 indicates that the communication of the output function bits is made directly, in the form of a data packet, over a communications link, bypassing the relay's output function contacts (which would be set by the output function bits) and any associated communications means.

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Claim 1 is differentiated from the references as follows: Cookson shows a conventional relay communications apparatus involving the setting of output contacts, the status of which contacts is monitored and then transmitted to another relay (or relays) by communications means over a conventional data link. This is representative of the prior art discussed above. Miyagi is the primary secondary reference. It, however, does not teach the key concept, i.e. the direct transmittal of protective relay output function bits in the form of data packets to another relay to inform that relay of the results of fault determination in the first relay. None of the other references teach such a concept as well.

Hence, applicants' invention is different than that taught by the cited references; moreover, those differences provide significant advantages over the prior art systems. The prior art makes no mention or reference to direct communication of output function bits to provide fault determination information between two relays (or more). The prior art uses the output function bits to set relay contacts, the status of which in turn are monitored and then transmitted by communications equipment. A substantial number of elements are eliminated by applicants' different approach, while at the same time, applicants' system is faster and more accurate.

Hence, in view of the above, claim 1 is patentable over the cited references. Further, claims 2-7, being dependent upon claim 1, are also patentable.

Allowance of the application is thus respectfully requested.

Please extend the period for response two months to February 12, 1997. A check in the amount of $195.00 is enclosed. Any additional fees can be charged to Deposit Account No. 07-1900.

Respectfully submitted,

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